RESEARCH ARTICLE

Transcultural-based health education model on families with diabetes mellitus

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Abstract

Objective: To develop a transcultural-based health education model to increase family abilities to care for type 2 diabetes patients.

Methods: A cross-sectional observational analytical study was conducted from May-June 2021. The study population comprised of the families of patients with diabetes in Buleleng who were included using the rule of thumb (n=180) by cluster random sampling. The variables in this study were cultural, patient, and family factors, family health functions, health education, and family abilities as measured by using a questionnaire. Data were analysed using Structural Equation Modeling-Partial Least Squares (SEM-PLS).

Results: The results showed that the model was capable and relevant to be applied with ability 73%. Cultural factors towards family health functions (T statistics = 2.344; *p*= 0.020), family factors (T statistics = 6.962; *p*= 0.000) and, patient factors (T statistics = 1.974; *p*= 0.049), had a significant influence on family health function which, in turn, affected family abilities through health education (T statistics = 22.165; *p*= 0.000). Family factors (T statistics = 5.387; *p*= 0.000), and health education (T statistics = 5.127; *p*= 0.000) also had direct influence on family abilities.

Conclusion: The education model was developed through cultural, family factors and family health functions, which could improve the ability of families to provide care. This model can be a reference to increase diabetes self-management in public health centres.

Keywords: Heuristics, public health, diabetes Mellitus, (JPMA 73: S-21 [Suppl. 2]; 2023)

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Introduction

Self-management of people with type 2 Diabetes Mellitus (DM) is one of the important mechanisms in the management of the chronic disorder. The success of diabetes management is determined by the role of the family as a caregiver.[1] However, not all families can act as good caregivers due to limited knowledge and ability to provide care.[2] In addition, the application of cultural values[3] such as patrilineal culture in family decision-making has not been included in health education. As a result, when problems arise in these patients, families are not capable to take appropriate health decisions, causing failure in self-management.

In 2019, there were 463 million adults (aged 20-79 years) who had DM in the world and by 2045 the number is expected to increase to 700 million.[4] The incidence of DM in Indonesia increased from 6.9% in 2013 to 10.9% in 2018.[5] The incidence of DM in Bali Province has also increased, starting from 1.3% in 2013 and then increasing to 1.7% in 2018. In Buleleng, the number of people with type 2 DM is high, with a figure of 7,841 people.[5] With the rise in figures of type 2 DM every year, it is anticipated that the ability of families caring for DM patients will also increase. Based on indicators of family support, only 11.1% of families provide support in the form of providing medicines, and only 22.2% of families play a role in providing support for the implementation of self-management of DM patients.[6] The low level of family support indicates the inadequate ability of the family in managing DM, which eventually deprives the patient of continued good and effective treatment.[7,8]

Lack of knowledge and misperceptions as well as lack of cultural adaptation to diabetes management are obstacles faced in providing social support, to the patient and the family.[3] Educational models and media will affect the increase in knowledge and understanding of patients and their families regarding care of DM.[9] The patrilineal culture of Balinese society can affect the structure of the role of a man who acts as a husband or the eldest son in a family with a sick family member. The formation of an educational model that considers the cultural aspects of the family can facilitate the process of receiving information. Previous educational models only considered family and social factors.[10,11] The purpose of this study was to develop a health education model based on transcultural nursing to improve the ability of families to care for type 2 DM patients.

Subjects and methods

An observational cross-sectional study was conducted from May to June 2021 to develop an educational model

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based on transcultural nursing to improve the ability of families to care for type 2 DM patients. The sample size was calculated using the rule of thumb (n=180) by a cluster random sampling technique. The participants of the study were blood relations from families of patients with DM living in the same home, being decision-makers based on patrilineal lines (males), and without cognitive or psychological disorders. Variable cultural factors, patient/individual factors, family factors, family health functions and health education were analyzed for their influence on the family's ability to care.

Research questions included demographic details, ownership of a personal glucometer, patrilineal culture,[12] religious beliefs,[13] access to health services, facilities and infrastructure and having a health insurance cover. Instrument B included demographic factors of the patient. Instrument C was for family factors,[14] and family structure and function.[15] Instrument D was related to family health function, instrument E was on health education and instrument F was on the family's ability to care. All instruments were tested for validity and reliability.

Data collection began after the research was approved by the Health Research Ethics Committee of the Faculty of Nursing UNAIR on April 21, 2021 with the ethics approval certificate number No. 2223-KEPK. Data collection was assisted by enumerators. Data were analyzed using partial least squares (PLS). The influence between variables was determined by the t-statistic value (t > 1.96), while the direction of influence (increasing or decreasing) was determined by the path coefficient.

Results

This research was conducted in four primary healthcare centers in Buleleng Regency, Bali, namely Buleleng III health center, Kubutambahan I health center, Sukasada I health center and Banjar I health center. Respondents in this study were 180 male family members (patrilineal) who cared for DM patients at home.

Table 1 shows that 56(31.1%) family members providing care were between 35 and 40 years age and all of them were males (100%). The educational background revealed 70(38,9%) to have basic education and most 0f them [50 (27.8%)] were Civil Servants (PNS) A low economic status was noted in 93 (51.7%) people It was also observed that the majority of families 78 (43.3%) had provided care for >36 months.

Based on the cultural factor variable, the majority of respondents had not applied cultural values in providing care to DM patients. A total of 120 (66.7%) respondents did not have a glucometer for monitoring blood glucose. The

Table-1: Characteristic distribution of family respondents who care for type 2 DM patients (n=180)

Respondents' Demographics Characteristics	Category	n (%)
Age	35-40 Years	56 (31.1)
	41-45 Years	12 (6.7)
	46-50 Years	24 (13.3)
	51-55 Years	26 (14.4)
	56-60 Years	42 (23.3)
	61-65 Years	20 (11.1)
Gender	Man	180 (100.0)
	Woman	0 (0.0)
Education		
	Base	70 (38.9)
	Intermediate	64 (35.6)
	High	46 (25.6)
Profession		
	Entrepreneur	33 (18.3)
	Civil servant	50 (27.8)
	Labourer	49 (27.2)
	Not Work	48 (26.7)
Economic status		
	Low	93 (51.7)
	Intermediate	87 (48.3)
	High	0 (0)
Length of caring		
	< 12 Months	26 (14.4)
	12-36 Months	76 (42.2)
	> 36 Months	78 (43.3)

Table-2: Distribution of Research Variables (n=180)

tIndicator Cultural factors	Category	n (%)	Mean±SD
Ownership of glucometer	Have	60 (33.3)	-
	Not Have	120 (66.7)	
Patrilineal values	Low	0 (0)	24.98±3.43
	Average	99 (55.0)	
	High	81 (45.0)	
Religious confidence	Low	7 (3.9)	26.54±3.89
	Average	135 (75.0)	
	High	38 (21.1)	
Access health services	Difficult	83 (46.1)	17.79±1.63
	Easy	97 (53.9)	
Facilities and infrastructure	Not enough	94 (52.2)	2.36±0.79
	Well	86 (47.8)	
Health insurance	BPJS	166 (92.2)	-
	Insurance Private	5 (2.8)	
	Not have insurance	9 (5.0)	
Patient Factors			
Stress	Light	38 (21.1)	18.27±3.55
	Average	90 (50.0)	
	Heavy	52 (28.9)	
Coping	Not enough	53 (29.4)	61.14±18,12
	Enough	102 (56.7)	
	Well	25 (13.9)	

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Table-2: *continued from previous page*

tIndicator Cultural factors	Category	n (%)	Mean±SD
Family Factors			
Knowledge	Not enough	81 (45.0)	10.71±4.41
	Enough	73 (40.6)	
	Well	26 (14.4)	
Family structure and function	Not enough	0 (0.0)	12.93±2.32
	Enough	160 (88.9)	
	Well	20 (11.1)	
Family Health Function			
Know health problem	Not enough	49 (27.2)	7.99±1.66
	Enough	115 (63.9)	
	Well	16 (8.9)	
Make decisions	Not enough	10 (5.6)	8.26±1.49
	Enough	148 (82.2)	
	Well	22 (12.2)	
Give maintenance	Not enough	52 (28.9)	7.78±1.57
	Enough	109 (60.6)	
	Well	19 (10.6)	
Maintain healthy house	Not enough	36 (20.0)	8.26±2.03
	Enough	114 (63.3)	
	Well	30 (16.7)	
Use health facility	Not enough	0 (0.0)	9.24±1.40
	Enough	136 (75.6)	
	Well	44 (24.4)	
Educational model Bondres			
Preservation	Not enough	9 (5.0)	8.43±1.33
	Enough	136 (75.6)	
	Well	35 (19.4)	
Negotiation	Not enough	27 (15.0)	12.8±2.01
	Enough	140 (77.8)	
	Well	13 (7.2)	
Restructuring	Not enough	27 (15.0)	5.61±0.82
	Enough	147 (81.7)	
	Well	6 (3.3)	
Managing diet	Not enough	109 (60.6)	14.82±5.75
	Enough	58 (32.2)	
	Well	13 (7.2)	
Do physical activity	Not enough	152 (84.4)	7.92±3.23
	Enough	28 (15.6)	
	Well	0 (0)	
Drug management	Not enough	128 (71.1)	7.44±2.45
	Enough	43 (23.9)	
	Well	9 (5.0)	
Blood sugar management	Not enough	109 (60.6)	6.21±2.55
	Enough	58 (32.2)	
	Well	13 (7.2)	
Manage stress and rest	Not enough	76 (42.2)	16.18±2.92
	Enough	94 (52.2)	
	Well	10 (5.6)	
Stop smoking habit	Not enough	135 (75.0)	7.62±2.16
	Enough	45 (25.0)	
	Well	0 (0)	

family's perception of access to health services was easy to reach 97 (53.9%) but the infrastructure used by health services was considered to be lacking 94 (52.2%). Half of the DM patients experienced moderate stress and their coping abilities were insufficient 102 (56.7%). The level of knowledge in most families in terms of DM and its management was low, 81 (45%). In addition, the application of the structure and function of the family in carrying out its role in caring for the majority of DM patients was sufficient 160 (88.9%). The application of the family health function was fairly good with an indicator that is still low regarding the ability to provide care 109(60.6%). The education model also had a fairly good score, specially the indicators of efforts to improve health conditions was 150 (81.7%). The ability of families to provide care for DM patients was lacking in almost all indicators, especially in the ability to manage medication 128(71.1%). Table 2

Table 3 shows the results based on the hypothesis analysis. It was observed that family health function was influenced by cultural factors (t = 1.955; *p*-value = 0.026), patient factors (t=2.481; *p*= 0.007), and family factors (t=6.963; *p*=0.000). Family ability was influenced by patient factors (t=1.768; *p*=0.039) and family factors (t = 6.028; *p*= 0.000), and family health functions affected the educational model (t= 5.711; *p*=0.000). The path-coefficient value showed that family factors were the largest variables which directly influenced the family's health function disorders and also on the family's ability to care for type 2 DM patients. Figure .

The results show that the transcultural-based education model is composed of several indicators which influence indirectly, namely cultural factors, patient factors, family factors, and are compiled directly by the family health function. This transcultural-based educational model can later be used to improve the family's care capabilities.

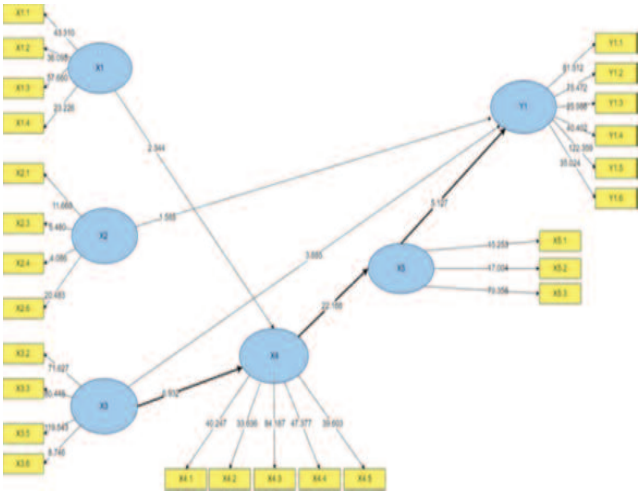

Figure: Development of Transcultural-Based Health Education Model on Families with Diabetes Mellitus

Table-3: Final Model of a Hypothesis Test on the Development of Transcultural-based Health Education Model on Families with Diabetes Mellitus

Variable	Path Coefficient	T Statistics	*P-Values*	Note
Culture Factor (X1) on family health function (X4)	0.193	1.955	0.026	Significant
Patient Factor (X2) on Family health function (X4)	0.154	2.481	0.007	Significant
Family factor (X3) on family health function (X4)	0.614	6.963	0.000	Significant
Culture Factor (X1) on family ability (Y1)	0.115	0.884	0.189	Not Significant
Patient factor (X2) on family ability (Y1)	0.036	1.768	0.039	Significant
Family factor (X3) on family ability (Y1)	0.715	6.028	0.000	Significant
Family health function(X4) on educational model (X5)	0.658	5.711	0.000	Significant

Discussion

Cultural factors made up the health education model indirectly by influencing the health function of the family. However, cultural factors do not affect the family's ability to care. Based on the results of the study, cultural factors are still lacking, especially in the ownership of the glucometer and the infrastructure used, besides that all respondents also still apply patrilineal values in daily life.

The ability to care for diabetes is important for families to know as nursing care providers[3] but, in practice, families still have low abilities, one of which is how to use a glucometer; this is because the majority of respondents do not have a glucometer to monitor blood glucose routinely. This gives the families poor grades in terms of health management specially in monitoring blood glucose.[16] Patriarchy as one of the cultural indicators, gives men enormous privileges, because men are in control of what is valued in society's culture. Health problems related to DM treatment can occur if the family member having the priority in decision-making does not have sufficient knowledge and abilities.[17]

Family factors directly affect the health function of the family, and are one of the indirect factors of the educational model. Family structure is a series of relationships which creates bonding within the family, and between the family and other social systems.[18] Family structure is influenced by the type of family adopted; it can affect their strengths and limitations in carrying out family development tasks, which directly or indirectly affect the health of individuals and families. In the family health function, it is known that the five aspects still have a low value. The family's health function directly affects the education model adopted. The functional perspective is concerned with the way the family relates to other family members.[19] Families need to know the state of health and the changes experienced by their family members. The slightest changes experienced will indirectly be a concern.[20] If any changes occur, their nature and intensity and time period should be recorded.[21]

After acquiring the ability to recognize health problems, the family member should make efforts to seek appropriate help according to the circumstances.[22] If complete satisfaction is not attained, follow-up treatment is necessary. Besides the care of the patient, living conditions should be kept healthy by maintaining cleanliness and good ventilation. If there are limitations for family care then local health services facilities should be utilised.

Conclusion

The transcultural model based on cultural and family factors was adopted for improving the family's health function. This facilitates integration of effective health education with principles in transcultural nursing. This has proved to have a beneficial effect on improving the family abilities in caring for a person with diabetes.

Besides being influenced by health education, the ability of the family member is also directly influenced by patient factors and family factors. Increasing the family's ability to provide good care to a person with diabetes, will not only improve the quality of life but also prevent the chronic complications of the metabolic disorder.

Study Limitation: The study was carried out during a pandemic so there were limitations in interacting with patients and families directly. The communication was performed regularly via WhatsApp with patients and families

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